4.2.3. Instantaneous Field of View

4.2.3.1. Purpose

The purpose of this test is to measure the IFOV of the FLIR in all field of view selections and to assess the utility of the range of IFOV selections for the assigned mission.

4.2.3.2. General

Most modern FLIRs are used for navigation and targeting when visibility is reduced. During navigation, a wide IFOV is desirable to provide as much of a panoramic view as possible as the aircraft moves along its course. As a targeting tool, a narrow IFOV with some amount of magnification is desirable to allow maximum accuracy in targeting data. Target search requires something in between to allow for a reasonable search area while still providing enough magnification to identify the target at mission relatable ranges. Note that in the context used here, a narrow IFOV implies magnification of some portion of the incoming IR scene.

4.2.3.3. Instrumentation

A tape measure and data cards are required for this test. A voice recorder is optional.

4.2.3.4. Data Required

Record the distance from the FLIR aperture to the wall. Record linear measurements of the vertical and horizontal field of views as marked on the wall for each IFOV selection. Include qualitative comments concerning the utility of the IFOV selections during navigation, target search and FLIR targeting.

4.2.3.5. Procedure

Park the test airplane with the nose pointed at a wall. Turn on and time out the FLIR, focusing it onto the wall at a point where the wall is perpendicular to a line extending from the FLIR aperture. Select the WFOV and have an assistant place a chalk mark at the intersection of the FLIR crosshairs. Close communication will be required as the assistant finds the location of this point. Have the assistant then mark the four corners of the IFOV of the FLIR in a similar fashion. Use the tape measure to determine the distance in inches from the FLIR aperture to the crosshair intersection mark (l). Measure the

horizontal (h) and vertical (v) measurements of the box formed by the corners of the IFOV marked by the assistant. Repeat for the NFOV. While airborne, perform mission relatable FLIR navigation to the target area making qualitative comments on the utility of the WFOV for navigation and orientation. Use the fuselage stabilized and geographically stabilized mode as required during the test. Following navigation to the target area, make qualitative comments concerning the utility of the WFOV and NFOV for detecting and identifying the target and in the NFOV make comments concerning the utility for making accurate updates of the cursors over the target position.

4.2.3.6. Data Analysis and Presentation

Use equation (28) to find the horizontal and vertical IFOV ($IFOV_h$, $IFOV_v$) in both NFOV and WFOV.

$$IFOV_h = \arctan\left(\frac{h}{l}\right)$$
$$IFOV_v = \arctan\left(\frac{v}{l}\right)$$

(28)

Relate the utility of the WFOV for FLIR navigation to the possibility of pilot disorientation as he or she attempts to navigate without enough of the outside scene available for view and to the possibility of impacting obstructions outside of the field of view. Relate the utility of the WFOV and NFOV for detecting and identifying the target to the probability of missed attacks and missed targets. Relate the utility of the NFOV for targeting to the highly accurate updates required to place ordnance on a target.

4.2.3.7. Data Cards

Sample data cards are provided as card 59.

CARD NUMBER ___

INSTANTANEOUS FIELD OF VIEW (GROUND TEST)

[POSITION THE AIRCRAFT CLOSE TO A WALL AND POINT THE FLIR AT A SPOT WHERE THE WALL IS PERPENDICULAR TO THE LINE FROM THE FLIR TO THE WALL. HAVE AN ASSISTANT MARK THE CROSSHAIRS AND CORNERS.]

	WFOV	NFOV
DISTANCE FROM APERTURE		
TO CROSSHAIRS MARK (l)		
VERTICAL DIMENSION (v)		
HORIZONTAL DIMENSION (h)		

Card 59: Instantaneous Field of View Data Cards

CARD NUMBER ___   TIME _____   PRIORITY L/M/H

INSTANTANEOUS FIELD OF VIEW (AIRBORNE TEST)

[DESCEND TO ___ FEET AGL AND SET MACH=__. SELECT WFOV AND THE FUSELAGE REFERENCED STABILIZATION MODE, SWITCHING TO THE GEOGRAPHICALLY STABILIZED MODE AS REQUIRED. START AT _____ AND NAVIGATE INBOUND TO THE _____ TARGET. FIND THE TARGET USING THE WFOV AND IDENTIFY USING THE NFOV. USE THE NFOV TO PROVIDE TARGETING, UPDATING THE FLIR CURSOR PLACEMENT AS REQUIRED.   PERFORM A _____ DELIVERY. REPEAT WITH DIFFERENT DELIVERY MODES AS TIME ALLOWS.]

COMMENTS:

Card 59: Instantaneous Field of View Data Cards (Continued)